SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT

RULE 4663 -- ORGANIC SOLVENT CLEANING, STORAGE, AND DISPOSAL

(Adopted December 20, 2001)

1.0 Purpose

The purpose of this rule is to limit the emissions of volatile organic compounds (VOCs) from organic solvent cleaning and from the storage and disposal of solvents and waste solvent materials.

2.0 Applicability

The provisions of this rule shall apply to any organic solvent cleaning performed outside a degreaser during the production, repair, maintenance, or servicing of parts, products, tools, machinery, equipment, or in general work areas at stationary sources. The rule shall also apply to the storage and disposal of all solvents and waste solvent materials at stationary sources.

3.0 Definitions

3.1 Aerosol Product: a hand-held, non-refillable container that expels a pressurized solvent-containing product by means of a propellant-induced force.

3.2 Application Equipment: a device, including, but not limited to, a spray gun, brush, and roller, used to apply adhesives, coatings, or inks.

3.3 Coating: a material applied onto or impregnated into a substrate for protective, decorative, or functional purposes. Such materials include, but are not limited to, paints, varnishes, sealers, and stains.

3.4 Composite Partial Pressure: the sum of the partial pressures of the VOC compounds in a solvent. The VOC composite partial pressure is calculated as follows:

$$PPc = \frac{\sum_{i=1}^{n} \frac{(W_i)(VP_i)}{MW_i}}{\frac{W_w}{MW_w} + \sum_{e=1}^{k} \frac{W_e}{MW_e} + \sum_{i=1}^{n} \frac{W_i}{MW_i}}$$

Where:

W_i = Weight of the "i"th VOC compound, in grams

W_w = Weight of water, in grams

W_e = Weight of exempt compound, in grams

MW_i = Molecular weight of the "i"th VOC compound, in grams per gram-mole
MW_w = Molecular weight of water, in grams per gram-mole
MW_e = Molecular weight of the "e"th exempt compound, in grams per gram-mole
PP_c = VOC composite partial pressure at 20°C (68°F), in mm Hg
VP_i = Vapor pressure of the "i"th VOC compound at 20°C (68°F), in mm Hg

3.5 Cured Adhesive, Cured Coating, or Cured Ink: an adhesive, coating, or ink that is dry to the touch.

3.6 Degreaser: a tank, tray, drum or other container in which objects to be cleaned are exposed to a solvent or solvent vapor in order to remove contaminants. The objects to be cleaned include, but are not limited to, parts, products, tools, machinery, and equipment. An enclosed spray application equipment cleaning system is not a degreaser.

3.7 Dissolver: an organic solvent that is added to an adhesive, coating, or ink in order to melt or to liquefy solid particles.

3.8 Electrical Apparatus or Electrical Components: all internal components such as wires, windings, stators, rotors, magnets, contacts, relays, energizers, and connections in an apparatus that generates or transmits electrical energy including but not limited to generators, transformers, and electric motors.

3.9 Electronic Components: all portions of an assembly such as circuit cards, printed wire assemblies, printed wiring boards, soldered joints, ground wires, bus bars, magnetic tapes and tape drive mechanisms, and other electronic fixtures, except the cabinet in which the components are housed.

3.10 Exempt Compound: an organic compound not classified as a volatile organic compound (VOC), as listed in the definition of volatile organic compound in Rule 1020 (Definitions).

3.11 Grams of VOC per liter of Material: the weight of VOC per volume of material and can be calculated by the following equation:

$$\text{Grams of VOC per liter of material} = \frac{Ws - Ww - Wec}{Vm}$$

Where:
Ws = Weight of volatile compounds, in grams
Ww = Weight of water, in grams
Wec = Weight of exempt compounds, in grams
Vm = Volume of material, in liters

3.12 High Precision Optics: optical elements used in electro-optical devices which are designed to sense, detect, or transmit light energy, including specific wavelengths of light energy and changes in light energy levels.

3.13 Janitorial Cleaning: the cleaning of building or stationary source components such as floors, ceilings, walls, windows, doors, stairs, bathrooms, etc., excluding work areas where maintenance or manufacturing are performed.

3.14 Liquid Leak: a visible solvent leak from a container at a rate of more than three drops per minute, or a visible liquid mist.

3.15 Maintenance Cleaning: the cleaning of tools, forms, molds, jigs, machinery, and equipment, and the cleaning of work areas where maintenance or manufacturing occurs.

3.16 Manufacturing Process: the process of making goods or articles by hand or by machine.

3.17 Medical Device: an instrument, apparatus, implement, machine, contrivance, implant, in vitro reagent or other similar article, including any component or accessory that meets the following conditions:

3.17.1 is intended for use in the diagnosis of disease or other conditions, or in the cure, mitigation, treatment, or prevention of diseases; or

3.17.2 is intended to affect the structure or any function of the body; or

3.17.3 is defined in the National Formulary or the United States Pharmacopeia, or any supplement to it.

3.18 Non-Absorbent Container: a container made of non-porous material that does not allow the migration of solvents through it.

3.19 Non-Atomized Solvent Flow: solvents in the form of a liquid stream without the introduction of any propellant.

3.20 Non-Leaking Container: a container without liquid leak.

3.21 Organic Solvent: the same as “Solvent.”

3.22 Organic Solvent Cleaning: an activity, or operation, or process, (including surface preparation, cleanup, or wipe cleaning), performed outside of a degreaser, that uses organic solvent to remove uncured adhesives, uncured coatings, uncured inks or other contaminants, including, but not limited to, dirt, soil, oil, lubricants, coolants, moisture, fingerprints, and grease, from parts, products, tools,

machinery, application equipment and general work areas. Cleaning spray equipment used for the application of coatings, adhesives, or ink, is also considered to be organic solvent cleaning.

3.23 Propellant: any gas, including air, in a pressure container for expelling the contents when the pressure is released.

3.24 Repair Cleaning: a solvent cleaning operation or activity carried out during a repair process.

3.25 Repair Process: the process of returning a damaged object or an object not operating properly to good condition.

3.26 Rolling, Consecutive 365-Day Period: any given date plus the immediate, previous 364 days.

3.27 Scientific Instruments: instruments (including the components, assemblies, and subassemblies used in their manufacture) and associated accessories and reagents which are used for the detection, measurement, analysis, separation, synthesis, or sequencing of various compounds.

3.28 Solvent: any liquid containing a volatile organic compound or combination of volatile organic compounds, which is used as a diluent, thinner, dissolver, viscosity reducer, cleaning agent, or for other similar uses. These liquids are principally derived from petroleum and include petroleum distillates, chlorinated hydrocarbons, chlorofluorocarbons, ketones, and alcohols. Solutions, emulsions, and dispersions of water and soap, or water and detergent, that contain 50 grams of VOCs per liter or less, as used, are not considered to be organic solvents.

3.29 Solvent Flushing: the use of a solvent to remove uncured adhesives, uncured inks, uncured coatings, or contaminants from the internal surfaces and passages of equipment by flushing solvent, by a non-atomized solvent flow, through the equipment.

3.30 Stationary Source: as defined in Rule 2201 (New and Modified Stationary Source Review Rule).

3.31 Stripping: the use of solvent to remove material such as cured adhesives, cured inks, cured or dried paint, cured or dried paint residue or temporary protective coating.

3.32 Surface Preparation: the removal of contaminants from a surface prior to the application of coatings, inks, or adhesives or before proceeding to the next step of a manufacturing process.

3.33 Thinner: a solvent that is added to an adhesive, coating, or ink to make it more fluid.

3.34 Viscosity Reducer: an organic solvent which is added to an adhesive, coating or ink to make it more fluid.

3.35 Volatile Organic Compound (VOC): as defined in Rule 1020 (Definitions).

3.36 Waste Solvent Material: any solvent which may contain dirt, oil, metal particles, sludge, and/or waste products, or wiping material containing VOCs including, but not limited to, paper, cloth, sponge, rag, or cotton swab used in organic solvent cleaning.

3.37 Wipe Cleaning: a solvent cleaning activity performed by hand rubbing an absorbent material such as a rag, paper, sponge, brush, or cotton swab containing solvent.

4.0 Exemptions

The provisions of this rule shall not apply to:

4.1 Janitorial cleaning, including graffiti removal.

4.2 Stripping of cured coatings, cured adhesives, and cured inks, except the stripping of such materials from spray application equipment.

4.3 Any source operation that is subject to or specifically exempted by any of the following rules or an EPA approved version of the applicable listed rule:

4.3.1 Rule 4602 (Motor Vehicle and Mobile Equipment Coating Operations),

4.3.2 Rule 4603 (Surface Coating of Metal Parts and Products),

4.3.3 Rule 4604 (Can and Coil Coating Operations),

4.3.4 Rule 4605 (Aerospace Assembly and Component Coating Operations),

4.3.5 Rule 4606 (Wood Products Coating Operations),

4.3.6 Rule 4607 (Graphic Arts),

4.3.7 Rule 4623 (Storage of Organic Liquids),

4.3.8 Rule 4652 (Coatings and Ink Manufacturing),

4.3.9 Rule 4653 (Adhesives),

4.3.10 Rule 4662 (Organic Solvent Degreasing Operations),

4.3.11 Rule 4672 (Petroleum Solvent Dry Cleaning Operations),

4.3.12 Rule 4684 (Polyester Resin Operations), or

4.3.13 Rule 4691 (Vegetable Oil Processing Operations).

4.4 The provisions of Sections 5.1.1 and 5.1.2 shall not apply to an owner or operator that uses 55 gallons or less of organic solvent products in all source operations subject to Rule 4663 in a stationary source, in any rolling, consecutive 365-day period.

5.0 Requirements

5.1 Organic Solvent Limits

5.1.1 From November 15, 2002, through November 14, 2003, an owner or operator shall not use organic solvents for cleaning operations that exceed the VOC content limits and composite partial pressure limits specified as being "Effective November 15, 2002 through November 14, 2003" in Table 1.

5.1.2 On and after November 15, 2003, an owner or operator shall not use organic solvents for cleaning operations that exceed the VOC content limits specified as being "Effective November 15, 2003" in Table 1. On and after November 15, 2003, the composite partial pressure of solvents used for cleaning operations will not be regulated.

Table 1 – Organic Solvent Limits

Type of Solvent Cleaning Operation	Effective November 15, 2002 through November 14, 2003		Effective November 15, 2003
	VOC Content Limit Grams of VOC/liter of material (lb/gal)	VOC Composite Partial Pressure Limit, mm Hg at 20°C (68°F)	VOC Content Limit Grams of VOC/liter of material (lb/gal)
A. Product Cleaning During Manufacturing Process or Surface Preparation for Coating, Adhesive, or Ink Application			
1. General	70 (0.58)	no limit	50 (0.42)
2. Electrical Apparatus Components and Electronic Components	900 (7.5)	33	500 (4.2)
3. Medical Devices and Pharmaceuticals	900 (7.5)	33	800 (6.7)
B. Repair and Maintenance Cleaning			
1. General	50 (0.42)	no limit	50 (0.42)
2. Electrical Apparatus Components and Electronic Components	900 (7.5)	20	900 (7.5)
3. Medical Devices and Pharmaceuticals			
3.1 Tools, Equipment, and Machinery	900 (7.5)	33	800 (6.7)
3.2 General Work Surfaces	900 (7.5)	33	600 (5.0)
C. Cleaning of Coating or Adhesive Application Equipment			
1. General	950 (7.9)	35	550 (4.6)

5.1.3 The provisions of Table 1 shall not apply to the following applications:

5.1.3.1 Cleaning of solar cells, laser hardware, scientific instruments, or high precision optics.

5.1.3.2 Cleaning in laboratory tests and analyses, or bench scale or research and development projects.

5.1.3.3 Cleaning of paper-based gaskets, and clutch assemblies where rubber is bonded to metal by means of an adhesive.

5.1.3.4 Cleaning of cotton swabs to remove cottonseed oil before cleaning of high-precision optics.

5.1.3.5 Until June 30, 2005, the cleaning of photocurable resins from stereolithography equipment and models.

5.1.3.6 Until June 30, 2005, the cleaning of ultraviolet lamps used for the curing of ultraviolet ink or coatings.

5.1.4 The provisions of Table 1 and Section 5.3 shall not apply to the cleaning of architectural coating application equipment provided that the cleaning solvent used does not exceed 950 grams of VOC per liter.

5.1.5 The provisions of Table 1, subsection C, shall not apply to the cleaning of application equipment used to apply coatings on satellites and radiation effect coatings.

5.1.6 The provisions of Section 5.2 of this rule shall only apply to an owner or operator that uses any solvent containing more than 50 grams of VOC per liter of material for organic solvent cleaning.

5.2 Cleaning Methods

5.2.1 Cleaning activities that use solvents shall be performed by one or more of the following methods:

5.2.1.1 Wipe cleaning; or

5.2.1.2 Application of solvent from hand-held spray bottles from which solvents are dispensed without a propellant-induced force; or

5.2.1.3 Non-atomized solvent flow method in which the cleaning solvent is collected in a container or a collection system which is closed except for solvent collection openings and, if necessary, openings to avoid excessive pressure build-up inside the container; or

5.2.1.4 Solvent flushing method in which the cleaning solvent is discharged into a container that is closed except for solvent collection openings and, if necessary, openings to avoid excessive pressure build-up inside the container. The discharged solvent from the equipment must be collected into containers

without atomizing into the open air. The solvent may be flushed through the system by air or hydraulic pressure, or by pumping.

5.2.2 Solvent shall not be atomized into the open air unless it is vented to a VOC emission control system that complies with Section 5.4. This provision shall not apply to the cleaning of nozzle tips of automated spray equipment systems, except for robotic systems, and cleaning with spray bottles or containers described in Section 5.2.1.2.

5.2.3 An owner or operator shall not use VOC-containing materials to clean spray equipment used for the application of coatings, adhesives, or ink, unless an enclosed system or equipment that is proven to be equally effective at controlling emissions is used for cleaning. If an enclosed system is used, it must totally enclose spray guns, cups, nozzles, bowls, and other parts during washing, rinsing and draining procedures, and it must be used according to the manufacturer's recommendations and must be closed when not in use.

5.3 Storage and Disposal of Solvents

An owner or operator shall store or dispose of fresh or spent solvents, waste solvent cleaning materials such as cloth, paper, etc., coatings, adhesives, catalysts, and thinners in closed, non-absorbent and non-leaking containers. The containers shall remain closed at all times except when depositing or removing the contents of the containers or when the container is empty.

5.4 VOC Emission Control System

In lieu of complying with the requirements in Sections 5.1.1 and/or 5.1.2, an owner or operator may comply with this rule by using a VOC emission collection and control system in association with the solvent cleaning operation, provided:

5.4.1 The emission control system collects at least 90 percent, by weight, of the emissions generated by the solvent cleaning operation and

5.4.1.1 has a destruction efficiency of at least 95 percent, by weight, or

5.4.1.2 has an output of less than 50 parts per million (PPM) calculated as carbon with no dilution; or,

5.4.2 If the solvent cleaning activity is associated with operations subject to Rule 4661 (Organic Solvents), the VOC emission control system meets the VOC emission control system overall capture and control efficiency requirements as specified in Rule 4661 (Organic Solvents).

6.0 Administrative Requirements

6.1 Compliance Statement Requirements

Manufacturers of any solvents subject to this rule shall indicate on the solvent container, or on a separate product data sheet or material safety data sheet, the name of the solvent, manufacturer's name, the VOC content, density, and VOC composite partial vapor pressure, as defined in the rule, of the solvent, as supplied. The VOC content and VOC composite vapor pressure shall be expressed in units of gm/liter or lb/gallon and mm Hg at 20^{o}C (68^{o}F), respectively.

6.2 Recordkeeping Requirements

An owner or operator shall comply with the following recordkeeping requirements:

6.2.1 Maintain the records required by Sections 6.2.2 through 6.2.5 at the stationary source for a period of five years. The records shall be made available to the APCO upon request.

6.2.2 Keep a copy of the manufacturer’s product data sheet or material safety data sheet of the solvents used for organic solvent cleaning activities.

6.2.3 Maintain a current list of solvents that are being used for organic solvent cleaning activities at the stationary source. The list shall include the following information:

6.2.3.1 The name of the solvent and its manufacturer’s name.

6.2.3.2 The VOC content of the solvent expressed in grams/liter or lb/gallon.

6.2.3.3 When the solvent is a mixture of different materials that are blended by the operator, the mix ratio of the batch would be recorded in order to determine compliance with the specified limits of VOC content and/or VOC composite partial pressure, as applied.

6.2.3.4 Through November 14, 2003, the composite partial pressure of the solvent expressed in mm Hg at 20^{o}C (68^{o}F).

6.2.3.5 The type of cleaning activity for each solvent that is being used at the stationary source in accordance with the applicable cleaning category specified in Table 1 of this rule.

6.2.4 An owner or operator claiming to be subject to Section 4.4 shall keep records of any additional information necessary to confirm that 55 gallons or less of organic solvent products are used in all source operations subject to this rule at the stationary source in any rolling, consecutive 365-day period. An owner or operator shall maintain usage records of non-compliant solvents on the days that non-compliant solvents are used.

6.2.5 VOC Emission Control System Recordkeeping Requirements

The owner or operator who operates an approved VOC emission control system in lieu of complying with the VOC content and composite partial pressure limits in Section 5.1 Table 1 shall maintain daily records of the control system's key operating parameters. The records shall include information such as temperatures, pressures, flowrates, hours of operation of the control system, and other information that is necessary to verify compliance with the required capture and control efficiency specified in Section 5.4. Records describing all maintenance work that require the VOC control system to be shut down shall be kept.

6.3 Test Methods

6.3.1 Determination of VOC Content

6.3.1.1 The VOC content of solvents and organic materials shall be determined by using United States Environmental Protection Agency (EPA) Test Method 24 or 24A, or South Coast Air Quality Management District (SCAQMD) Method 304 (Determination of Volatile Organic Compounds in Various Materials), or by using the manufacturer's product formulation data and the formula for "Grams of VOC per liter of Material" in Section 3.0.

6.3.1.2 The content of exempt halogenated VOCs shall be determined by using the California Air Resources Board (ARB) Test Method 432 or SCAQMD Test Method 303 (Determination of Exempt Compounds).

6.3.2 Determination of Control Efficiency of VOC Emission Control Devices

6.3.2.1 The capture efficiency of each collection device shall be demonstrated according to the EPA's document "Guidelines for Determining Capture Efficiency," dated January 9, 1995. An equivalent alternate test method that has been approved by EPA, ARB, and the APCO may be used.

6.3.2.2 The emission control system efficiency of any air pollution control equipment shall be determined using EPA Methods 2, 2A, or 2D for measuring flow rates and EPA Methods 25, 25A, or 25B for measuring total gaseous organic concentrations at the inlet and outlet of the control device. EPA Test Method 18 or ARB Method 422 shall be used to determine the emissions of exempt compounds.

6.3.2.3 The overall capture and control efficiency shall be calculated by using the following equation:

$$CE_{CAPTURE\ AND\ CONTROL} = [\ CE_{CAPTURE} \times CE_{CONTROL}\ ] / 100\ \%$$

Where:

$CE_{CAPTURE\ AND\ CONTROL}$ = Overall Capture and Control Efficiency, in percent

$CE_{CAPTURE}$ = Capture Efficiency of the collection device, in percent, as determined in Section 6.3.2.1

$CE_{CONTROL}$ = Control Efficiency of the control device, in percent, as determined in Section 6.3.2.2.

6.3.3 Determination of Vapor Pressure

The composite partial pressure of solvents shall be determined by:

6.3.3.1 Determining the identity and quantity of each compound in a blended organic solvent by using ASTM D2306, or SCAQMD Method 308 or by using ASTM E260 for organics and ASTM D3792 for water content, if applicable, or the manufacturer's product formulation data, and

6.3.3.2 By determining the vapor pressure of each pure VOC component by using ASTM D2879 or from publications such as Perry's Chemical Engineer's Handbook, CRC Handbook of Chemistry and Physics, Lange's Handbook of Chemistry, or other District approved sources; and

6.3.3.3 By calculating the composite partial pressure of the solvent by using the formula for "Composite Partial Pressure" in Section 3.0. For the purpose of this calculation, the blended solvent shall be assumed to be an ideal solution where Raoult's Law applies. The partial pressures of each compound at 20º C (68º F) shall be used in the formula.

6.3.4 Determination of Solvent Losses from Spray Gun Cleaning Systems

The passive and active solvent losses from spray gun cleaning systems shall be determined by using SCAQMD "General Test Method for Determining Solvent Losses from Spray Gun Cleaning Systems" dated October 3, 1989. The test solvent for this determination shall be lacquer thinner with a minimum vapor pressure of 105 mm Hg at 20^{o}C. The minimum temperature shall be 15^{o}C.

6.4 Multiple Test Methods

When more than one test method or set of test methods is specified for any testing, a violation of any requirement of this rule established by any one of the specified test methods or set of test methods shall constitute a violation of this rule.

6.5 Version of Test Methods

All ASTM test methods referenced in Section 6.0 are the most recently EPA-approved version that appears in the Code of Federal Regulations as Materials Approved for Incorporation by Reference.

7.0 Compliance Schedule

Unless otherwise specified in the respective sections, an owner or operator shall comply with the requirements of this rule on and after November 15, 2002.

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